What is claimed is:

[c01] 1. A method for signal-adaptive noise reduction in digital radiographic images, comprising the steps of:

obtaining raw x-ray image data of an imaged object;

processing the raw x-ray image data to create processed x-ray image data;

inputting the raw x-ray image data and the processed x-ray image data to an image processor;

developing an intensity modulation image from the raw x-ray image data;

deriving a structure-dependent noise filtered image using the processed x-ray image data;

performing signal attenuation-dependent blending; and

creating a noise-reduced digital x-ray image therefrom.

[c02] 2. The method of claim 1, wherein the raw x-ray image data represents a detected x-ray signal from an imaged object.

[c03] 3. The method of claim 1, wherein the processed x-ray image data represents pixel intensity values of the raw x-ray image data after display processing.

[c04] 4. The method of claim 1, wherein the intensity modulation image represents a predefined weighting function based on absolute detected intensities or digital image signal levels, and includes the effects of imaging system gain.

[c05] 5. The method of claim 1, wherein deriving the structure-dependent noise filtered image using the processed x-ray image data comprises utilizing structure-dependent noise filtering.

[c06] 6. The method of claim 1, wherein performing signal attenuation-dependent blending comprises blending together the structure-dependent noise filtered image and the processed x-ray image data by modulating the blending values at each pixel location using the intensity modulation image.

[c07] 7. The method of claim 1, further comprising:

outputting the noise-reduced digital x-ray image from the image processor.

[c08] 8. A method for signal-adaptive noise reduction in digital radiographic images, comprising the steps of:

obtaining raw x-ray image data of an imaged object;

processing the raw x-ray image data to create processed x-ray image data;

inputting the processed x-ray image data to an image processor;

developing an intensity modulation image from the processed x-ray image data;

deriving a structure-dependent noise filtered image using the processed x-ray image data;

performing signal attenuation-dependent blending; and

creating a noise-reduced digital x-ray image therefrom.

[c09] 9. The method of claim 8, wherein the raw x-ray image data represents a detected x-ray signal from an imaged object.

[c10] 10. The method of claim 8, wherein the processed x-ray image data represents pixel intensity values of the raw x-ray image data after display processing.

[c11] 11. The method of claim 8, wherein the intensity modulation image represents a predefined weighting function based on absolute processed intensities or digital image signal levels.

[c12] 12. The method of claim 8, wherein deriving the structure-dependent noise filtered image using the processed x-ray image data comprises utilizing structure-dependent noise filtering.

[c13] 13. The method of claim 8, wherein performing signal attenuation-dependent blending comprises blending together the structure-dependent noise filtered

image and the processed x-ray image data by modulating the blending values at each pixel location using the intensity modulation image.

[c14] 14. The method of claim 8, further comprising:

outputting the noise-reduced digital x-ray image from the image processor.

[c15] 15. A method for signal-adaptive noise reduction in digital radiographic images, comprising the steps of:

obtaining raw x-ray image data of an imaged object;

processing the raw x-ray image data to create processed x-ray image data;

inputting the raw x-ray image data and the processed x-ray image data to an image processor;

developing a first intensity modulation image from the raw x-ray image data;

developing a second intensity modulation image from the processed x-ray image data;

deriving a structure-dependent noise filtered image using the processed x-ray image data;

performing signal attenuation-dependent blending; and

creating a noise-reduced digital x-ray image therefrom.

[c16] 16. The method of claim 15, wherein the raw x-ray image data represents a detected x-ray signal from an imaged object.

[c17] 17. The method of claim 15, wherein the processed x-ray image data represents pixel intensity values of the raw x-ray image data after display processing.

[c18] 18. The method of claim 15, wherein the first intensity modulation image represents a predefined weighting function based on absolute detected intensities or digital image signal levels, and includes the effects of imaging system gain.

[c19] 19. The method of claim 15, wherein the second intensity modulation image represents a predefined weighting function based on absolute processed intensities or digital image signal levels.

[c20] 20. The method of claim 15, wherein deriving the structure-dependent noise filtered image using the processed x-ray image data comprises utilizing structure-dependent noise filtering.

[c21] 21. The method of claim 15, wherein performing signal attenuation-dependent blending comprises blending together the structure-dependent noise filtered image and the processed x-ray image data by modulating the blending values at each pixel location using the first intensity modulation image and the second intensity modulation image.

[c22] 22. The method of claim 15, further comprising:

outputting the noise-reduced digital x-ray image from the image processor.

[c23] 23. A computer-readable medium encoded with programming for facilitating signal-adaptive noise reduction in digital radiographic images, the programming configured to:

obtain raw x-ray image data of an imaged object;

process the raw x-ray image data to create processed x-ray image data;

input at least one of the raw x-ray image data and the processed x-ray image data to an image processor;

develop at least one of: a first intensity modulation image from the raw x-ray image data, and a second intensity modulation image from the processed x-ray image data;

derive a structure-dependent noise filtered image using the processed x-ray image data;

perform signal attenuation-dependent blending; and

create a noise-reduced digital x-ray image therefrom.

[c24] 24. The computer-readable medium of claim 23, wherein the raw x-ray image data represents a detected x-ray signal from an imaged object.

[c25] 25. The computer-readable medium of claim 23, wherein the processed x-ray image data represents pixel intensity values of the raw x-ray image data after display processing.

[c26] 26. The computer-readable medium of claim 23, wherein the first intensity modulation image represents a predefined weighting function based on absolute detected intensities or digital image signal levels, and includes the effects of imaging system gain.

[c27] 27. The computer-readable medium of claim 23, wherein the second intensity modulation image represents a predefined weighting function based on absolute processed intensities or digital image signal levels.

[c28] 28. The computer-readable medium of claim 23, wherein the programming derives the structure-dependent noise filtered image using the processed x-ray image data by utilizing structure-dependent noise filtering.

[c29] 29. The computer-readable medium of claim 23, wherein the programming performs signal attenuation-dependent blending by blending together the structure-dependent noise filtered image and the processed x-ray image data by modulating the blending values at each pixel location using at least one of: the first intensity modulation image and the second intensity modulation image.

[c30] 30. The computer-readable medium of claim 23, further comprising programming configured to:

output the noise-reduced digital x-ray image from the image processor.

[c31] 31. A digital radiographic imaging system comprising:

an x-ray source;

an x-ray detector in operative communication with the x-ray source; and

a signal-adaptive noise reduction system in operative communication with the x-ray detector,

wherein the signal-adaptive noise reduction system comprises programming configured to:

obtain raw x-ray image data of an imaged object;

process the raw x-ray image data to create processed x-ray image data;

input at least one of the raw x-ray image data and the processed x-ray image data to an image processor;

develop at least one of: a first intensity modulation image from the raw x-ray image data, and a second intensity modulation image from the processed x-ray image data;

derive a structure-dependent noise filtered image using the processed x-ray image data;

perform signal attenuation-dependent blending; and

create a noise-reduced digital x-ray image therefrom.

[c32] 32. The digital radiographic imaging system of claim 31, wherein the programming derives the structure-dependent noise filtered image using the processed x-ray image data by utilizing structure-dependent noise filtering.

[c33] 33. The digital radiographic imaging system of claim 31, wherein the programming performs signal attenuation-dependent blending by blending together the structure-dependent noise filtered image and the processed x-ray image data by modulating the blending values at each pixel location using at least one of: the first intensity modulation image and the second intensity modulation image.